

## **Chapter 2 – Foodborne Disease Outbreaks**

Foodborne disease organisms and occasionally toxins and chemicals enter every food establishment, probably every day. Therefore, the supervisor needs general information about these unwelcome visitors. This section is to address that need.

### **IDENTIFICATION OF DISEASE ORGANISMS**

Important foodborne disease organisms, toxins and chemicals and their affect on public health are identified in the chart contained in this section. The following comments pertaining to the chart are important:

**Causative Agent.** This is the bacterium, virus, or other cause of a foodborne illness. Unfortunately, most of the diseases and the organisms that cause them (or causative agents) do not have easy-to-remember names. They are technical names created by scientists. Although it is not necessarily important to be able to pronounce them, it is important to be able to associate a name with a particular disease.

**Incubation time.** Incubation time is the time period from ingestion of the organism, toxin or chemical to the time symptoms start.

**Onset Time.** Onset time is the time that symptoms start.

**Symptoms.** Most symptoms are understandable. Less common terms are explained in the glossary.

### **FOODBORNE DISEASE OUTBREAK**

When people ingest foodborne disease organisms, toxins or chemicals, an outbreak often occurs. Therefore, it is important to know the **definition of a foodborne disease outbreak**. It is defined as follows:

- A. Two or more persons experiencing a similar illness, usually gastrointestinal, after eating a common food.

B. Epidemiologic analysis or laboratory test implicates food as the source of illness.

C. One case of botulism or chemical poisoning constitutes an outbreak.

### **OCCURRENCE OF FOODBORNE DISEASE OUTBREAKS**

Of the places identified, the frequency of foodborne disease outbreaks in the United States is as follows (percent frequency in parentheses):

- Restaurants, cafeterias, delicatessens and other commercial food establishments (57%)
- Homes (29%)
- Schools (6%)
- Church functions (3%)
- Picnics (3%)
- Camps (2%)

Because many foodborne disease outbreaks are not recognized or just considered "a bug that's going around," many foodborne disease outbreaks go unreported. It is estimated that the actual number of outbreaks is 10 to 100 times more than reported – perhaps as many as 76 million cases per year. These cases result in an estimated 325,000 hospitalizations and 5,000 deaths each year in the United States.

### **FACTORS CONTRIBUTING TO OUTBREAKS**

Investigations of foodborne disease outbreaks have revealed the following as the most important contributing factors:

- Poor personal hygiene
- Improper holding temperatures
- Inadequate cooking
- Contaminated equipment
- Food from unsafe source
- Other

Poor personal hygiene is generally recognized as the most common contributing factor for foodborne illness. This

simply means that food establishment workers don't wash their hands enough throughout the day. Proper handwashing is one of the most simple, yet effective ways to minimize the risk of causing a foodborne illness.

### **ECONOMIC IMPACT OF OUTBREAKS**

Although the full economic impact of foodborne diseases has not been measured, preliminary reputable studies estimate that the 12.6 million annual cases in the United States cost \$8.4 billion. The number of cases and cost are continuing to rise. The chart includes the annual number of cases and the average cost per case.

### **IDAHo FOODBORNE DISEASE OUTBREAKS**

The following outbreaks represent a few that have occurred in Idaho:

- 650 persons became ill after eating at a Moscow restaurant. Salad bar lettuce contaminated with a viral agent was the suspected cause.
- 11 confirmed cases of salmonellosis were attributed to a foodborne disease outbreak at a Kootenai County truck stop. It is suspected that poor food handling practices by the employees caused the outbreak.
- 165 persons became ill after eating a catered meal at a Boise athletic club. It is suspected that sick food handlers contaminated coleslaw during preparation.
- 33 persons became ill after eating a catered meal at a McCall business meeting. It is believed that the food handler contaminated the food with a viral agent.
- A number of people became ill after eating the "daily special" at a Butte County restaurant. Ham, and stool samples of two ill persons, were positive for the same food poisoning organism.
- 11 people attending a southeastern Idaho movie theater became ill after drinking carbonated fountain drinks contaminated with copper from the water line.
- 8 people attending a wedding reception became ill after eating deli foods prepared by an employee with an infected hangnail.

## **SUMMARY**

- Foodborne disease organisms and occasionally toxins and chemicals enter every food establishment probably every day.
- The onset time, symptoms and severity of foodborne diseases vary depending on the causative agent.
- Common symptoms of foodborne illness include abdominal pain, nausea, vomiting, and diarrhea. However, these symptoms can vary greatly from person to person and can also vary for each of the possible causative agents.
- Two or more persons experiencing a similar illness after eating a common food generally identify a foodborne disease outbreak.
- Restaurants, cafeterias, delicatessens and other commercial food establishments are blamed for more than half of the foodborne disease outbreaks.
- The five most important factors contributing to outbreaks are improper holding temperatures, poor personal hygiene, inadequate cooking, contaminated equipment, and food from unsafe sources.
- It is estimated that 12.6 million cases of foodborne diseases occur in the United States each year at a cost of \$8.4 billion.
- Examples of Idaho outbreaks suggest that Idaho food establishments are not immune from outbreaks.

## **IMPORTANT FOODBORNE DISEASE ORGANISMS, TOXINS AND CHEMICALS OF PUBLIC HEALTH SIGNIFICANCE**

Disease/Causative Agent	Onset Time	Symptoms	Common Food	Contributing Factors*	Duration/Ann US Cases/Average Case Cost
Staphylococcal Food Poisoning <u>Staphylococcus aureus</u>	2-4 hours (2 - 7)	Abrupt onset of severe nausea, cramps, vomiting, malaise	Poultry and meat products, egg and potato salads, sauces, dairy products, cream filled	1, 3, 5	Usually Less than 24 hours 185,060 cases \$1,310

			baked products		
Salmonellosis <u>Salmonella</u> spp.	12-36 hours (6 - 72)	Sudden onset of abdominal pain, fever, nausea, diarrhea; sometimes vomiting	Poultry and meat products, eggs, milk, melons, chocolate	1, 2, 3, 5	Several days 1,341,873 cases \$1,350
<u>Clostridium perfringens</u> Food Poisoning	10-12 hours (6 - 24)	Abdominal cramps and watery diarrhea; sometimes with nausea, vomiting and fever	Meats, poultry, soups, gravies, sauces, stews, casseroles	1,2	Usually less than 24 hours 248,520 cases \$190
Botulism <u>Clostridium botulinum</u>	12-36 hours (2 - 140)	Blurred or double vision, dysphagia, dry mouth, vomiting, constipation or diarrhea	Improperly processed, canned, low-acid or alkaline foods; cooked vegetables in oils or butter; foods out of refrigeration in air-tight packages	1, 2, 6	2 - 8 months 58 cases \$322,000
<u>Bacillus cereus</u> Food Poisoning	1-24 hours	Nausea and vomiting for emetic phase, abdominal cramps and diarrhea for diarrheal phase	Rice dishes and pasta products; meat products, soups, vegetables, puddings, sauces	1	Usually less than 24 hours 27,360 cases \$190

Shigellosis <u>Shigella</u> spp.	24-72 hours (12 - 96)	Abdominal cramps, watery diarrhea (may contain blood and pus), fever, nausea	Meats, shellfish, vegetables, salads, water	1, 5	4 - 7 days 89,648 cases \$390
<u>Escherichia coli</u> 0157:H7 Food Poisoning	4 days (3 - 9 days)	Abdominal cramps, watery diarrhea which later becomes grossly bloody; sometimes vomiting	Ground beef, raw milk, any foods handled by infected person	2, 5	2 - 9 days 62,458 cases Cost undetermined
Listeriosis <u>Listeria monocytogenes</u>	3 - 70 days	Mild to moderate flu-like symptoms - fever, intense headache, nausea, vomiting; abortions and stillbirths in pregnant women	Contaminated meats, dairy products and vegetables	1, 3, 5	Duration variable 2,493 cases \$12,500
Campylobacteriosis <u>Campylobacter</u> spp.	3 - 5 days (1 - 10)	Nausea, vomiting, abdominal pain, diarrhea, fever, malaise	Meats, poultry, milk	1, 3, 4	1 - 2 weeks 1,963,141 cases \$920
Viral Hepatitis A	28 - 30 days	Onset abrupt with	Shellfish, sandwiches,	5	2 - 6 weeks

	(15 - 20)	fever, malaise, anorexia, nausea, abdominal discomfort, dark urine, jaundice	salads, other foods handled by infected person		9,200,000 cases \$5,000
Viral Gastroenteritis Norovirus	16-48 hours (5 - 72)	Nausea, fever, abdominal cramps, vomiting, watery diarrhea	Shellfish, any foods handled by infected person	1, 4, 5	24 - 48 hours 181,000 cases \$890
Scombroid Poisoning Histamine-like substances	1 minute - 3 hours	Flushing, dizziness, headache, burning mouth and throat, vomiting, diarrhea	Tuna, mackerel, bluefish, skipjack, bonito, blue dolphin and related fish	1, 4	Recovery within 24 hours 31,000 cases \$970
Heavy Metal Poisoning Antimony, cadmium, copper, zinc, etc.	Few minutes - 2 hours	Nausea, vomiting, abdominal cramps, diarrhea	High-acid foods and beverages	3, 6	Recovery within 24 hours 96,000 cases \$300

\*Most common, as established by CDC: 1) Improper holding temperatures; 2) Inadequate cooking; 3) Contaminated equipment; 4) Food from unsafe source; 5) Poor personal hygiene; 6) Other